Snow-level Forecast Performance

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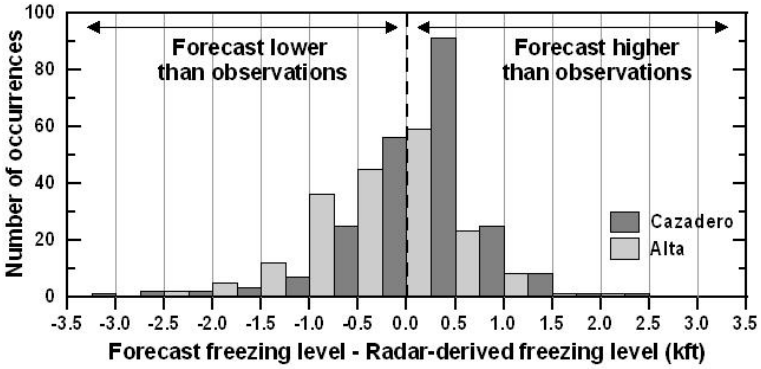
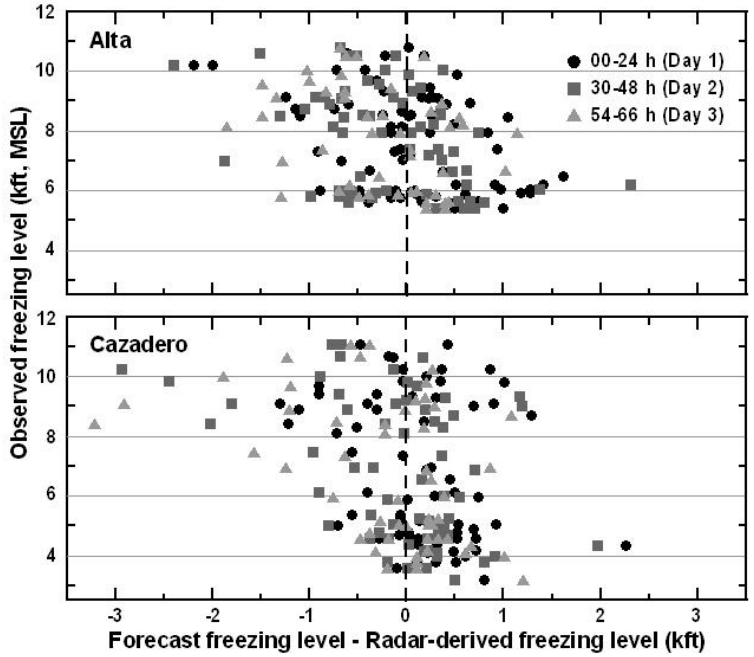
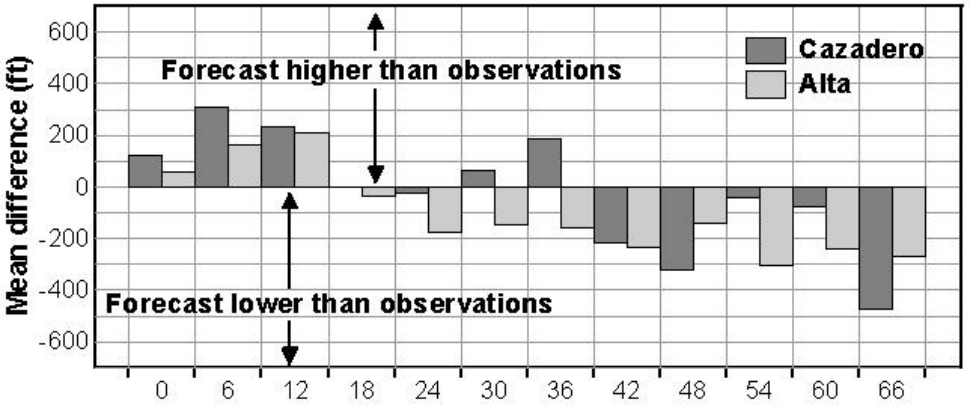
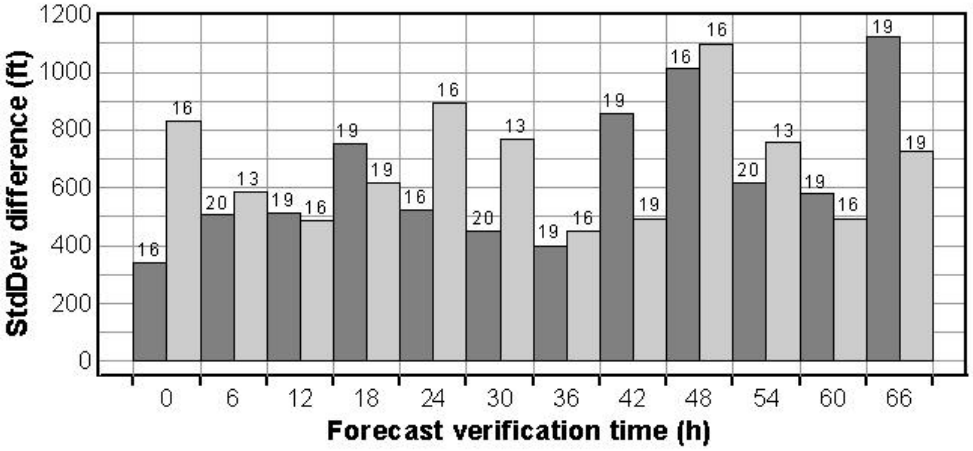
- JHM article (June 2010) describes evaluation of CNRFC freezing-level forecasts verified with S-band radar-observed freezing levels at Cazadero, CA and Alta, CA.





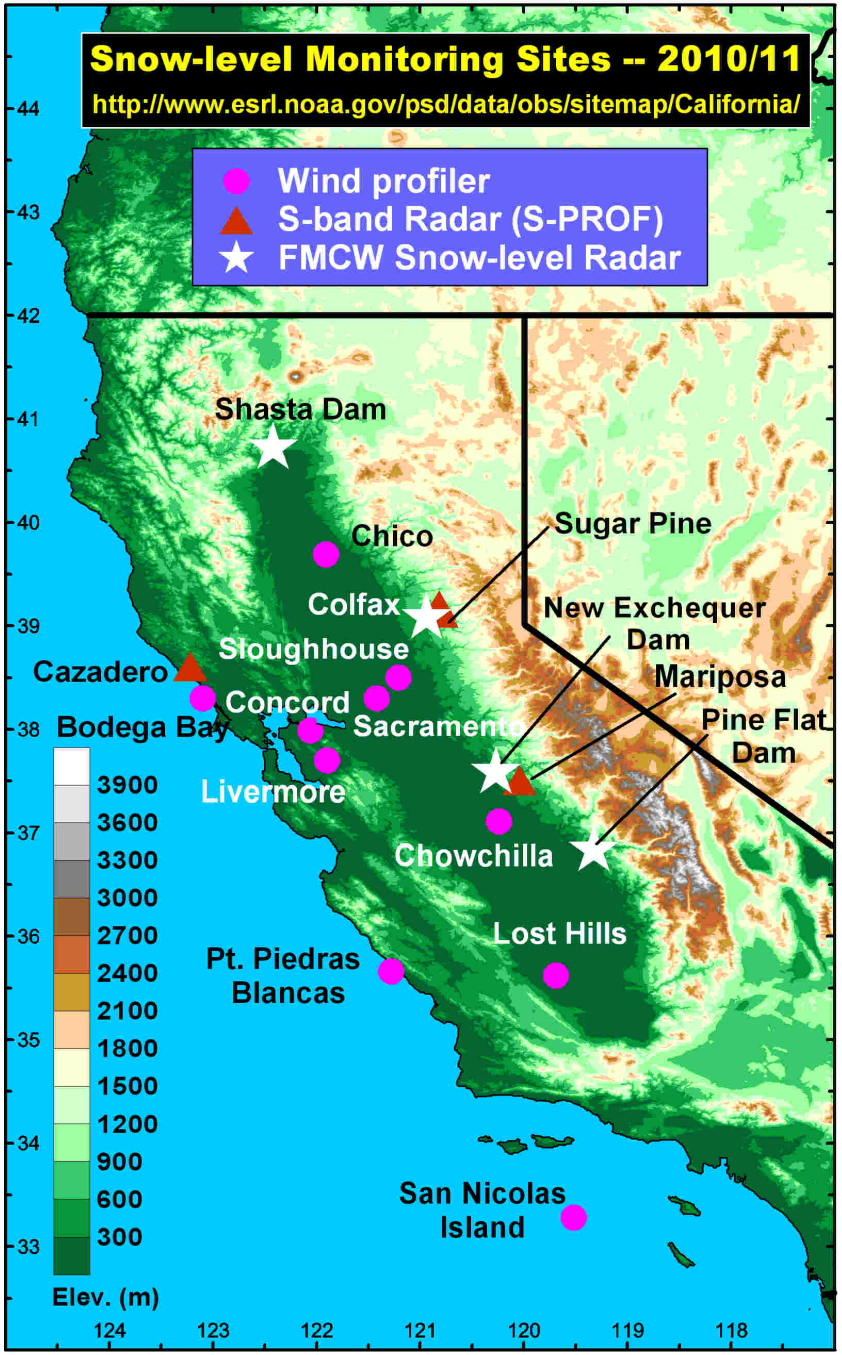


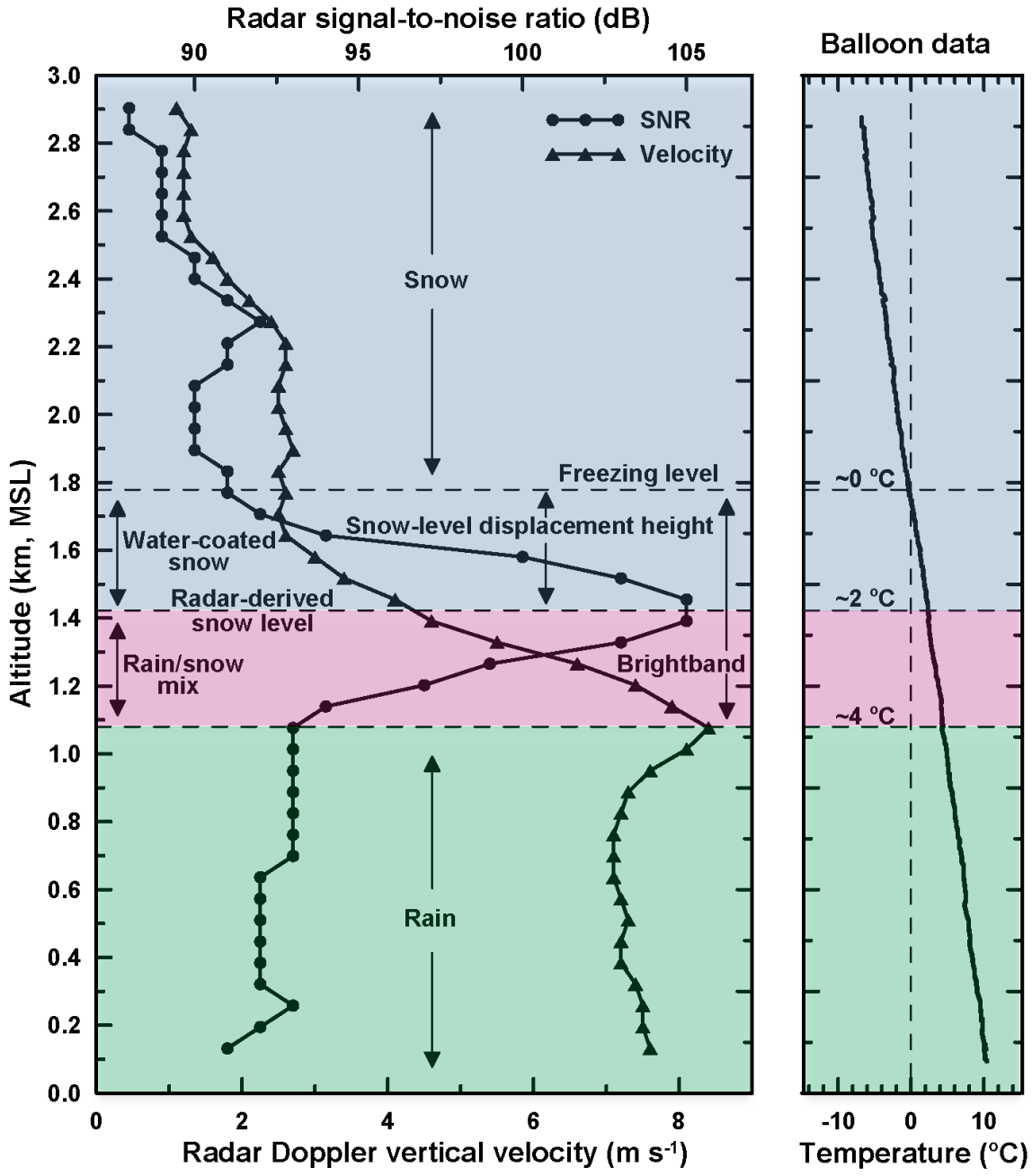


- ~15% of the forecasts were biased low by 1,000 ft or more. Most of these cases were associated with freezing levels above 7,500 ft, which were forecasted lower than what was observed by 1,000–3,000 ft. These cases also were associated with the wettest storms.
- The height difference between the freezing level and the radar-derived snow level varies between 400 and 1,400 ft and is consistent with the 500–1,500-ft range that the CNFRC publicly reports as being the range of snow-level offsets typically used.
- Based on this and other findings in the paper, future forecast performance can rely on the snow-level forecasts made by the NWS verified by the radar-derived snow level.
- Ed Clark at NWS OCWWS has expressed interest in expanding the snow level verification work to other years/sites where ESRL has collected snow-level datasets.

Snow-level will be measured at 17 sites in CA and 2 sites in WA this winter. Would it be possible for CNRFC and NRFC to archive snow level forecasts at some or all of these specific locations?

Dan Gottas is currently archiving CNRFC and NRFC HAS forecasts for the available forecast points, in addition to GFS and NDFD grids to further snow-level forecast performance research.



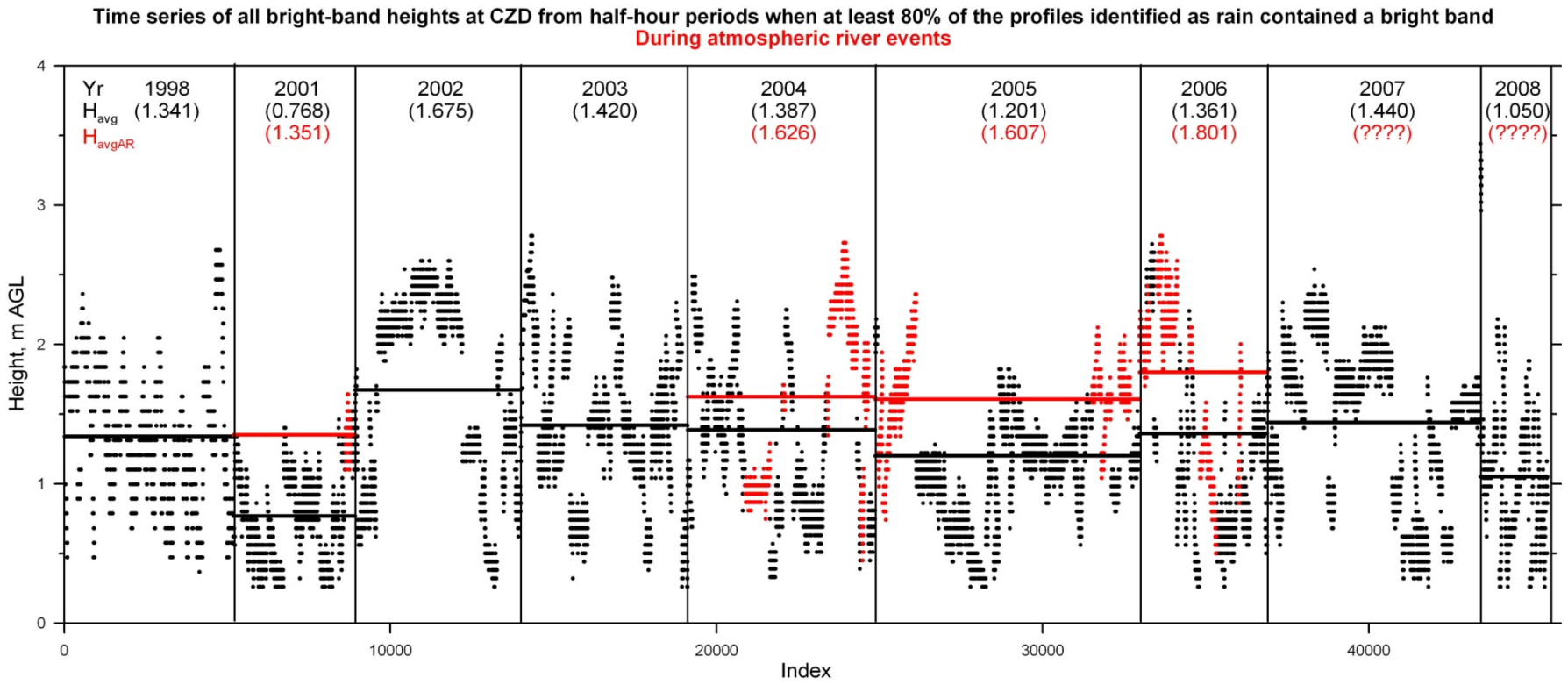


ESRL/PSD Snow-level Automated Algorithm

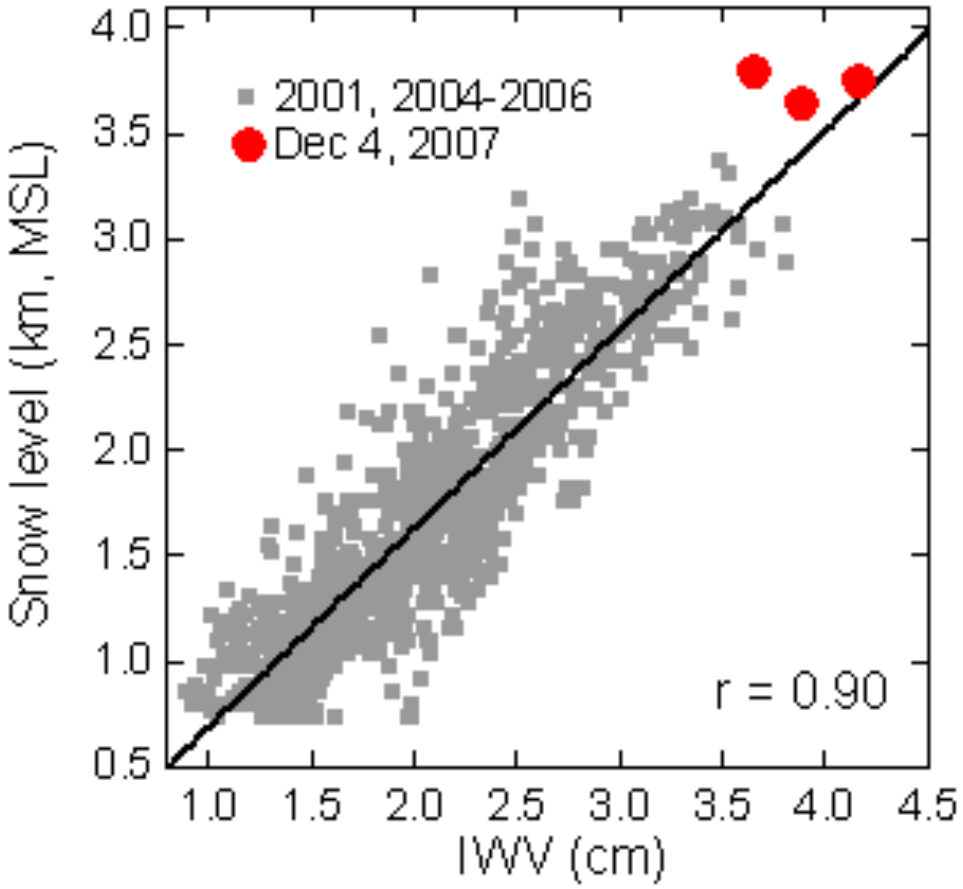
Snow-level forecast verification is based on an automated algorithm developed by scientists at ESRL/PSD (White et al. 2002, JTech, U.S. Patent #6,625,140). The algorithm can be used with vertically pointing Doppler radars operating at 449, 915, and 2875 MHz.

"The snow-level measurements provided by HMT have changed the way we do business with respect to snow-level forecasting." Art Henkel, CNRFC

- Nine years of snow-level measurements from Cazadero, CA. Catalog of atmospheric river (AR) events during four of those years indicates that snow levels average 1368 ft (417 m) higher in AR events than in non-AR events.



- No surprises, ARs are warm and wet!



- Of all the data products developed for NOAA's Hydrometeorology Testbed (HMT), the snow-level product is the most used by NWS Weather and River Forecast offices.